

THE macdonald JOURNAL

JULY 1972



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THE MACDONALD LASSIE

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Journal Jottings

Headlines and editing were put
aside for a couple of days late in
May for what I have come to
consider a most welcome change
of pace — picture-taking at the
Annual Convention of the Quebec
Women's Institutes. I do hope
they keep asking me to take their
photos for them for if they don't
when I'll have to find another
excuse to attend. I've seen the
words "Pennies for Friendship" for
years and known of the use to
which this money is put, but it
was the infectious enthusiasm of
ACWW's Deputy President, Mrs.
Graham Spry, that made me truly

realize the vast importance of the
work being done by some 6½
million countrywomen around the
world, including members of the
QWI. The pennies are the tools of
accomplishment; the friendship is
beyond monetary value. This, too,
was made evident in the many
discussions and in the slide
presentation of the Quebec
delegation to the ACWW
Conference in Oslo, Norway that
brought the Convention to a close.
In between there were plays to
enjoy, handicrafts to examine and,
most important of all, people to
meet — some for the first time
and happily some that now seem
to be old friends. I still can't put
names to all the friendly faces nor

faces with all the familiar names but
that gap will close somewhat as
we continue to work together to
give the QWI the publicity it
deserves.

Officially, I was supposed to be
working. The results you'll find in
this month's QWI section, with
a few shots left over for future
issues. Unofficially, work it wasn't;
a pleasure it was!

Hazel M. Clarke

A few days ago I observed several of the tours that school children take at the Macdonald College Farm. Most of these children come from elementary schools in the centre part of Montreal and many had never been on a farm before or had ever seen live farm animals. Some found it very difficult to believe that the milk they drink actually came from a live cow rather than from a package in a supermarket. Others jumped back in fear everytime a cow approached them from the other side of the fence. However, near the end of the tour the children were much more at ease and you could sense that they were beginning to understand where the milk, the meat, and eggs came from that they have seen their mothers buy in the grocery store.

The tours for urban school children are just one small example of the type of promotion and public relations effort that people in agriculture need to undertake in order to inform and educate urban people of the problems and future developments in agriculture. These types of educational efforts are becoming more and more important for several reasons. First, the number of farms and farmers has been decreasing over the past

few decades while there has been an accompanying dramatic increase in the number of people living in urban areas. Second, during this same time there has been a large shift in the nation's wealth and accompanying political power and representation to urban areas.

As a result of these two factors, it is becoming increasingly more important that farmers make a more active effort to widen the number of contacts they have with the urban sector. The contacts could take several forms. Perhaps a farmer's organization and the local Chamber of Commerce could co-host a banquet or picnic several times a year. Or perhaps a group of farmers could organize a tour of farms in the community to demonstrate to urban people the problems and latest technological developments in agriculture. Or perhaps local farm groups could get involved in the activities of civic and community organizations in urban areas.

These are the types of activities that do take time away from a farmer's normal work routine on the farm. Also because the results from such activities are not always readily visible, many farmers are reluctant to get involved. However, educational activities of this nature can be viewed as a long-term investment in the future of farming. The returns to this investment may not put any money in the farmer's bank account for the first few years, but in the long run may just be one of the most important activities farmers can do in terms of gaining the support and understanding of the non-farming segment of our society.

Gordon Bachman

WATER POLLUTION: THE EFFLUENCE OF AFFLUENCE

Studies have indicated that water availability in the United States, assuming present consumption rates, will restrict the population of that nation to 230 million. Any substantial increase above this figure will result in a drop in the American standard of living due to water shortage. While Canada possesses an abundance of natural water, availability of this resource is limited, to some extent at least, by the concentration of the population in five major cities and adjacent to the U.S. border. Such localization of the population, at great distance from much of the water, reduces the potential usefulness of this commodity.

In terms of direct human needs, good sense clearly requires that we insist on maintaining water quality at a level sufficient to meet the standards imposed by direct human uses. Only then will it be possible to conserve and re-use the limited water available to us.

We should not delude ourselves into thinking, however, that maintaining natural water quality at a standard adequate to meet the requirements imposed by direct human needs is sufficient to solve water pollution. Initially the human use of water may not be detrimentally affected by minor variations in its quality. Unfortunately though, even small changes in the quality of natural waters may render the aquatic environment totally inhospitable to the complex of aquatic species which previously thrived there. Because of their complete dependence on the medium and their generally great sensitivity to minor changes in the physical, chemical, and biological characteristics of the habitat, even ex-

tremely limited amounts of contamination may drastically alter the survival ability of the aquatic species present.

Each water body, furthermore, has its own peculiar set of conditions in terms of such characteristics as oxygen content, in the form of dissolved oxygen, nutrient and mineral concentrations, temperature and silt content. Consequently it supports its own particular aquatic species complex, the members of which are adapted to that set of conditions. Changes in aquatic conditions will, therefore, vary in their effects on the organisms depending on the previous conditions and the requirements of the species. At one end of the spectrum effects may be minor or completely nonexistent. At the other extreme small changes, though apparently insufficient to have toxic effects on any organisms, may cause the ultimate death or emigration of most of the organisms present.

The great variation in the possible results of contamination is due to the fact that, although the peculiar environmental conditions at the site of contamination may render substances harmless, frequently contaminants have deleterious effects at concentrations as much as 100 times less than those at which rapid death occurs.

If, therefore, we wish to preserve the aquatic life of our waterways, it is necessary to set and enforce quality standards which are much stricter than would be adequate simply to provide water clean enough for our own immediate needs.

Before discussing some of the issues associated with reducing the level of water pollution, it will be helpful to examine briefly some of the burdens placed on water by the activities of man.

Most people are familiar, to some extent at least, with the problem caused by the release of large quantities of organic wastes into natural waters. The main result of this act is oxygen depletion due to the heavy oxygen requirement of those bacteria which are responsible for decomposing the organic matter.

Oxygen used during decomposition is replaced by the absorption of oxygen from the air and the production of oxygen by plants during daylight. It can be seen that the release of large quantities of organic waste into those lakes and rivers where oxygen replacement is extremely slow will result in significant oxygen depletion. If the situation becomes severe, total oxygen removal will occur. In this event decomposition of the organic waste continues, but by the action of a different bacterial group which utilises oxygen bound in chemical compounds. This causes the build up of an oxygen debt, and the release of foul smelling methane, ammonia and hydrogen sulfide. The oxygen debt, a result of these bacteria acting as chemical reducing agents, is replenished before the free dissolved oxygen of the water is restored to normal thus severely aggravating the oxygen depletion problem.

Slow-moving rivers, lakes, and waters with few plants are generally low, both in dissolved oxygen and the ability to replace any oxygen lost. Any waterway may suffer

sufficient oxygen depletion, following the introduction of large amounts of organic waste, to harm the organisms present. Though dissolved oxygen concentrations below five parts per million are sufficiently low in themselves to harm all fresh-water fish species, concentrations somewhat above this figure may be low enough to increase the susceptibility of organisms to other contaminants. In this case animals may leave the waterway, and those species which migrate through the area seasonally to reach breeding grounds will be unable to do so. The dissolved oxygen concentration in flowing waters of the St. Lawrence, for example, falls as low as 7.5 parts per million in places.

The major contributors to the organic waste content of effluents are chemical industries, domestic sewage, paper and allied industries, food industries and agriculture. An indication of the dimensions of the problem can be obtained by comparing the Biochemical Oxygen Demand of sewage, sawdust and fresh water. The B.O.D. is a calculation of the oxygen utilised by these substances during their decomposition, over a five-day period, and is quoted in terms of the number of parts of oxygen required per million parts of the decomposing substance. For fresh water the figure is less than two, for sewage the figure is approximately 600, while the figure of 1,300,000 for sawdust is an indicator of the danger associated with the discharge, by the pulp and paper industries, of large amounts of wood chippings etc. into rivers.

Domestic sewage and farm wastes also present waterways with large quantities of nutrients, contributing

particularly to the eutrophication of lakes. Eutrophication is essentially a natural process whereby lakes gradually age due, in part, to increases in the nutrient content of the water brought about by the nutrient influx from rivers flowing into the lake. Considerable changes in the characteristics of the lake ensue, including marked changes in the plant and animal species. The process of eutrophication has been intolerably accelerated by the actions of man.

Although all nutrients contribute to the problem, phosphorous is generally singled out for concern because this element is usually the limiting factor controlling plant abundance. If present in large quantities, phosphorous leads to the formation of the familiar algal blooms associated with eutrophication. Abundant plant life produces excess oxygen during daylight. At night, however, and particularly when seasonal plant deaths and organic decomposition occur, oxygen depletion results. This may become severe enough in some seasons to cause the death of large numbers of fish. More permanent results of eutrophication include changes in the fish populations from salmon/trout abundance to perch/bass abundance.

Estimates indicate that 40 per cent of the annual phosphorous input into Lakes Erie and Ontario was due to detergent, whilst another 25 per cent was due to domestic sewage. Government action is belatedly and slowly forcing the detergent industry to reduce the phosphorous content of its products. Unfortunately, however, the natural process of organic waste

decomposition, which also forms the basis for secondary sewage treatment projects, does not cut down on the nutrient contribution from sewage. The reason is simply that the release of nutrients from organic matter is the natural result of the decomposition process, during which complex organic compounds are broken down into their constituent elements. Phosphates and nitrates are nutrients which also cause water enrichment when used excessively as fertilizer by seeping through soil into waterways.

In many lakes the nutrient input exceeds the output. There is, further, a tendency for large quantities of nutrients to become stored in the depths of the lake. Seasonal agitation of the lake waters causes the release of parts of the store, which are then added to the nutrients already cycling, thus aggravating the eutrophication process. It is apparent, therefore, that removal of the sources of input will not immediately halt eutrophication, whilst reversal could only be accomplished by removing both the free and stored nutrients.

Domestic sewage presents man with another problem due to its ability to carry and spread pathogenic organisms, particularly bacteria such as those causing typhoid, diphtheria, etc.

The coliform count, with which most people are familiar, is a rough indicator of the degree of contamination of water by disease causing bacteria. It is measured and quoted as the number of fecal coliforms, or the number of total coliforms (originating in soil, water, etc. and including the intestinal fecal bacteria from warm blooded animals)

present in 100 millilitres of water. For water to be fit for direct consumption the count for total coliforms must be lower than five, whilst water with a total coliform count of 5,000 can be consumed only after purification by a complex treatment process.

As the fecal coliform count may vary by as much as 90 per cent of the total coliforms present, a more accurate assessment of potential danger is a direct measure of the fecal coliform number. This figure will reflect sewage pollution alone whilst the total coliform count simply reflects coliform bacteria numbers regardless of the source. Thus for recreational activities like swimming, the fecal coliform count should be below 400, whereas the total coliform count should be below 1,000. Total coliform counts for waters around the island of Montreal, for example, vary between 75 and 150,000.

Viruses, which cause such diseases as polio, are by and large not considered in assessing water pollution unless an epidemic occurs.

Municipal wastes also contain many substances which, if present in sufficient concentration, will have direct toxic effect on aquatic organisms. There are few substances which are not toxic at some concentration. In many cases, while the short term threshold for lethality, i. e., the minimum concentration at which the substance causes death, may be known, the concentration at which an adverse reaction begins to take effect may be completely unknown. As has been previously indicated, such a concentration can be 100 times lower than the lethal dose.

It is possible, therefore, that the substance may be present, in natural waters, in a concentration close to that at which it could become the limiting factor and eradicate a species if subject to any increase. Such an occasion might indeed arise if there were significant addition of this particular substance in municipal waste.

Toxic substances may be persistent in the body of organisms. In this case they will build up gradually either through retention and addition by the individual organism or by accumulation in increasing quantity through the food chain. Thus toxic substances may, even though present in extremely small quantities, slowly accumulate and cause death. It is apparent that aquatic organisms living in contaminated waters are constantly exposed to hazardous chemicals and may suffer at concentrations far below those at which humans would suffer.

It is necessary to realise that, in addition to such familiar poisons as mercury, lead, cyanide, arsenic and pesticides, such elements as zinc and copper can become poisonous. The only pressure exerted to control the contamination of waterways by chemicals is a hope that sufficient dilution will occur after their release to lower their concentration below hazardous levels.

Examples of toxic substances may serve to demonstrate the dimensions of the problem. Toxaphene is one of the chlorinated hydrocarbon pesticides related to DDT. It is considered hazardous to human health at a concentration of only five parts per billion.

Deleterious effects are suffered by fish, however, at levels below a third of that. It is possible that some of the more active pesticides are so toxic that their use anywhere near fresh waters, into which runoff may occur, could destroy much of the aquatic life in those waters.

Zinc is a contaminant in mine wastes. It may be a natural limiting factor for rainbow trout whose immature stages are harmed by concentrations of zinc above 10 parts per billion. The concentration of this element in most of the waters of North America, including the relatively unpolluted Lake Superior, is significantly greater than this. Clearly, the addition of zinc to waters frequented by these fish may increase its concentration to a level above that which they can tolerate. It is worth noting furthermore, that if the limiting figure set for human consumption (5,000 parts per million) were actually achieved in all North American waters, this fish would be completely eliminated.

Though many poisons are dangerous on their own, it is important to realise that the toxic effects of several chemicals acting together are greater than can be explained simply by adding the toxic effects of the chemicals acting individually.

Of some significance also is the toxic effect many chemicals have on bacteria. It is possible that those bacteria performing the organic decomposition of the waste may be killed, thus increasing the time it takes waterways to recover from organic pollution.

(Continued on inside back cover)

Control the Acid-Content of Your Wines!

Introduction

There are five common terms that keep occurring when one discusses the quality of a wine. These terms are flavour, bouquet, body, astringency and acidity. The first two terms need no explanation since tastes and odours are common everyday experiences. The body of a wine is that subtle fullness or smoothness that a sip of the beverage leaves in the mouth of the taster. Astringency, which is primarily due to the presence of tannins, is the puckering or drying sensation that the wine produces in the mouth. These taste sensations may be enhanced or depressed by the acidity of the wine. The acid content of the must is important. A sufficient level of acidity inhibits the growth of moulds and putrefactive bacteria which decompose proteins and thus yield odorous and bad tasting compounds. The presence of acid leads to the formation of certain esters which add to the flavour of the product.

Practically all fruits contain some acid, though in many cases its presence may be masked by high flavour or by sugars in the fruit. Grapes contain several acids, the principal one being tartaric acid. Some grapes can contain as much as 1.5 per cent acid and yet do not seem to be particularly sour to the taste. The principal acid present in apples is malic acid, in citrus fruits it is citric acid. Rhubarb, which is not a fruit, contains large amounts of oxalic acid. This somewhat toxic acid should be removed from the rhubarb before it is used for making wine.

Most commercial wines are made from grapes and it has become traditional to refer to acidity in

musts in terms of their tartaric acid content, even though that may not be the acid that is present. This idea may seem somewhat odd but such a shift in references is common to our times. In the financial world we often refer to the capital worth of a company in dollar-terms even though all of its assets may be in foreign countries and currencies. We can determine its wealth by using conversion factors to bring everything to dollar-terms. All acids have certain acid values and these can be expressed in terms of the acid value of tartaric acid. The acid values of wines differ. In terms of tartaric acid white wines range from 0.4 to 0.5 per cent while red wines lie between 0.5 and 0.6 per cent. Heavy wines or sweet wines may contain slightly higher amounts of acid without any apparent deleterious effects. The preparation of consistently good wines demands, next to cleanliness, a close control of the acidity of the must. Now it becomes necessary for us to learn how to carry out this control process.

Principles of Acid Determination

Acids have a sour taste and in the presence of acids the indicator, phenolphthalein, is colourless. Bases on the other hand have a bitter, soapy taste and turn phenolphthalein indicator red. One of the strongest bases we have is sodium hydroxide. Its common names are soda lye or just plain lye. When acids and bases are carefully mixed together in the correct proportions they will counterbalance or neutralize each other's properties. The mixing process is known as titration. If the strength of the base is known, as well as the volumes of the basic solution and acidic solution, the strength of the acid can be

calculated. A solution which contains a known amount of acid or base is known as a standard solution. It is much easier to accurately weigh out a tartaric acid sample than a sample of lye so our first solution (primary standard) is tartaric acid.

Standard Tartaric Acid

Thoroughly clean a 40-oz. (1136 ml) bottle and transfer to the bottle 5.7 grams of tartaric acid. Use a plastic funnel for the addition of the acid to the bottle taking care that **all** of the acid goes into the bottle. Add water to the base of the neck, stopper the bottle and shake it to dissolve all of the acid.

Standard Sodium Hydroxide Solution

Thoroughly clean a second 40-oz. bottle and, with the aid of the funnel, transfer to it 3.5 grams of lye. (Lye is **very corrosive to the skin, clothing and metals — be careful.**)

Add water to the base of the neck, stopper, and shake to dissolve and mix thoroughly. Both bottles must be kept tightly closed by cork or plastic stoppers when not being used.

Indicator Solution

Phenolphthalein indicator solution may be purchased at wine-makers supply stores or it may be obtained from a druggist. The solution contains 0.2 grams of phenolphthalein in 100 ml of wood alcohol. One ounce of solution will be sufficient to carry out about 250 titrations. Keep the bottle tightly stoppered to prevent drying.

To check and adjust the alkaline solution

Sodium hydroxide (lye) absorbs water and carbon dioxide readily from the air and it is, therefore, almost impossible to obtain it in pure form. Sodium hydroxide solutions, therefore, must be standardized against a solution of tartaric acid. Carefully fill one of the 10-ml syringes with tartaric acid solution; there must be no bubbles in the syringe. Add exactly 10 milliliters of the acid to a large wine-glass or an ordinary non-coloured juice glass. Then add two drops of the indicator solution and swirl gently to mix the materials. Now fill the second syringe with the alkali (sodium hydroxide solution) and set the plunger exactly at the 10-ml mark. Add the alkali, a couple of drops at a time, to the acid in the glass and swirl the mixture after each addition. Continue to do this until the addition of a single drop of alkali causes the solution in the glass to turn from colourless to pink or red. This colour-change marks the "end-point" of the titration. The volume of alkali added is the difference between 10 ml and the final position of the plunger. For example: Suppose that after a titration the final position of the plunger is at 2, then the amount of solution that was delivered was 10 - 2, or 8 ml. The volume of acid used was 10 ml and, since a smaller amount of alkali solution was used, the alkali solution is too strong and must be diluted. (A 10 milliliter volume of standard tartaric acid should require 10 ml of the base or alkali solution.) How much water to add? This can be calculated as follows: One quart of solution (40 oz.) is 1136 ml, for ease in arithmetic say it is 1100

ml. The amount of water that must be added to ALL the alkali is $1100 \times 10 - 1100$ or 275 ml.

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(one imp. fl. oz. = 28.4 ml.) The volume of water to be added in fluid ounces is 9.6. A 40-oz. bottle won't hold a volume of 1375 ml so you must do the mixing in a larger container. Pour the solution back and forth between the new container and the 40-oz. stock bottle several times, then fill the bottle and discard the excess amount of solution.

If it should happen that a bigger volume of alkali than 10 ml is needed to neutralize 10 ml of standard tartaric acid solution, it means that the base is too weak and a small amount of solid lye must be added to the stock bottle and dissolved. We cannot go into the calculations needed to decide how much; you will have to solve this problem by trial and error if it arises.

To measure must acidity

White or light-coloured musts are easily tested, the procedure being exactly as outlined above. Place exactly 10 ml of the must in a glass, add two drops of indicator solution and titrate with the base solution. The acid content of the must in percent is equal to the volume of alkali used divided by 20. For example, suppose that 10 ml of a must required 6.6 ml of the sodium hydroxide solution for neutralization, then the acidity of the must, in terms of tartaric acid, is 6.6 or .33

20

per cent. Two titrations should be carried out and the average value taken.

Red wines are very hard to titrate. Usually the sample is added to the wine glass as before, the indicator is then added along with 3-4 oz. of water (distilled water if possible). As the titration proceeds, the natural colouring agents in the musts will turn to a greenish or grayish tint. The end-point colour change of the indicator can then be seen when it occurs, especially if the test is done in daylight.

If musts contain too much acid, it is best to dilute them by the addition of water until a test shows that the proper acid level has been reached. Most often acid needs to be added. To increase the acidity of one gallon of a must by 0.1 per cent, one must add 4.54 grams of tartaric acid or 4.24 grams of citric acid.

(Last December, Prof. Henneberry's article "A Lesson in Good Taste . . . Making Wine" outlined the fundamental requirements for this fascinating hobby. We suggest that you refer back to this article before attempting any of the following recipes. Ed.)

Recipes

1. Rhubarb Wine

5 lb. rhubarb
2-1/2 lb. sugar
1 lb. light raisins
1/8 tsp. tannin (or 1 cup of strong tea)
1/2 tsp. diammonium hydrogen phosphate (yeast nutrient)
1/4 tsp. thiamin
3 quarts water

Cut the rhubarb into 1/2"-1" lengths, place it in a pail and pour over it the three quarts of boiling water. Let stand for 24 hours. Strain off

the rhubarb, squeezing out as much juice as possible. Stir into the liquid 2 oz. of powdered calcium carbonate (or magnesium carbonate). This substance may produce some foaming when it is added because it reacts with the oxalic acid that is present in the juice. Let the juice stand for two days then very carefully siphon the clear liquid away from the solid. This liquid will be fairly free of oxalic acid. Test the acidity of the juice and adjust the acidity to 0.4-0.5 per cent using citric acid. Add the sugar, tannin, thiamin, ammonium phosphate and stir until dissolved. Chop the raisins and add them to the must. Crush and add 1 Campden tablet and let the covered must stand for 24 hours before adding the active yeast. After fermentation has continued for 5 days in the covered pail, strain the must into a sterilized gallon jar and fit a fermentation lock. Rack when all fermentation has ceased. Rack again in three months. Age wine for 1 year.

2. Dandelion Wine

3 quarts lightly packed dandelion flowers. (Pick on a warm, dry day when flowers are fully opened and gather as little green calyx as possible.)
 2½ lb. sugar
 1 lb. chopped light raisins
 ⅛ tsp. grape tannin
 ½ tsp. yeast nutrient
 ¼ tsp. thiamin
 1 gal. water
 11.4 gm. tartaric acid and 10.6 gm. citric acid.

Place the flowers in a pail and pour in 1 gal. of boiling water. Let stand for two days with occasional

stirring. Strain the juice into another container and squeeze the flowers to recover as much juice as possible. Clean the pail and return the juice to it. Add all of the ingredients plus a Campden tablet and stir until all the salts and sugar are dissolved. Cover and let rest for 24 hours before adding the yeast starter. Ferment for 4-5 days then strain into a clean gallon jug and fit a fermentation lock. Rack in 1 month. Use boiled water to fill the bottle to the base of the neck. Rack again in 3 months. Age for 1 year.

3. Pineapple Wine

2 large ripe pineapples (weight - about 8 lbs.)
 3 lb. sugar.
 ⅛ tsp. tannin
 1 tsp. yeast nutrient
 ¼ tsp. thiamin
 3 quarts water

Wash the pineapples thoroughly then remove the tops and bottoms. Slice the fruit into thin sections and place them in a large enamel or stainless steel kettle. Add 3 quarts of water, bring to a boil and simmer gently for 15-20 min. Pineapples contain a proteolytic enzyme which will destroy yeasts. The enzyme itself is destroyed by heat. The gentle simmering does not develop a cooked flavour in this wine but it does destroy the enzyme. Strain the juice into a pail squeezing the pulp lightly. Add the sugar and tannin and stir. When the liquid has cooled to body temperature add the thiamin, yeast nutrient and enough boiled water to bring the volume up to 1 gallon. Adjust the acidity to 0.5 per cent using tartaric acid if necessary. Add the yeast

starter. Ferment for 4 days then rack into a secondary fermentor fitted with a fermentation lock. This wine ferments slowly and will require about 6 weeks to ferment out. Rack in 2 months. Rack every 2 months until the wine is clear and throws no further deposit. After the second racking add one crushed Campden tablet making sure it dissolves. Be careful to splash the wine as little as possible during racking to preserve its fresh flavour. This should be a fairly strong, slightly sweet wine. It should be matured for 1 year.

4. Apple Wine

2 48-oz. tins of apple juice.
 2½ lb. sugar
 ½ tsp. yeast nutrient
 ¼ tsp. thiamin
 ⅛ tsp. tannin
 Water to make 1 gallon.

Place all ingredients in a plastic pail and stir to dissolve. Adjust the acidity to 0.45 per cent using half and half tartaric acid and citric acid. Sulfite the must with 1 Campden tablet and let stand for 24 hours before adding the starter. Transfer to a secondary fermentor as soon as fermentations slow up.

This makes a very pleasant light wine that is very slightly sweet although it sometimes ferments to dryness. It ages rapidly and can be used in 6 months but is better if kept for a year.

Prof. G. O. Henneberry,
 Department of Chemistry.

The Family

Farm

Published in the interests
of the farmers of the province
by the Quebec Department of
Agriculture and Colonization

CROP PRODUCTION

Aims: This program is designed to encourage Quebec farmers to diversify by undertaking the production of crops which are in short supply, thus suiting their production to market needs and making their farms more profitable;

Hasten the introduction and establishment of new crops in areas where climate and soil are favourable.

I — SOYBEANS

Provincial Soybean Growing Contest

1. Territory and eligibility:

a) This contest will be restricted to growers in zone 1 i.e., agricultural regions 5 (Sherbrooke), 6 (St. Hyacinthe), and 7 (Southwest of Montreal);

b) Competitors must sow at least 10 acres;

c) Growers wishing to enter for the contest must submit an application to their local or regional agricultural office before August 1, 1972;

d) Competitors must sow one of the certified or registered varieties recommended by the Quebec Plant Productions Council;

e) The maximum width between the rows of plants must not exceed 24 inches.

2. Judging and prizes:

Judging will be based on the appearance, evenness and uniformity, cleanness, maturity and probable yield of the field. The judges' decision shall be final and without appeal.

Awards will be as follows:

1st prize	\$200
2nd prize	175
3rd prize	150
4th prize	125
5th prize	100
6th prize	75
7th prize	62.50
8th prize	50
9th prize	37.50
10th prize	25

II — SPRING WHEAT

With a view to promoting the introduction and growing of new high-yielding varieties of spring wheat, the Department of Agriculture and Colonization offers to subsidize production of this crop on certain conditions.

1. Eligibility:

a) Only certified or registered varieties of PITIC 62 or OPAL wheat are eligible.

b) The crops must be grown in zones 2 or 3, that is to say anywhere in the province except agricultural regions 6 (St. Hyacinthe) and 7 (Southwest of Montreal).

2. Subsidy:

This subsidy will be paid to eligible growers at a diminishing rate for three years, as follows:
First year, \$10 for each acre sown;
Second year, \$7 for each acre sown;
Third year, \$5 for each acre sown.

The grant will be applied to the purchase of seed of the above-mentioned varieties upon presentation of a voucher and following inspection of the seeded acreage by the administrative staff of the regional agricultural office. It will not be paid on more than 20 acres per farmer.

Application must reach regional agricultural offices before July 1. In order that farmers unable to take advantage of this policy during its first two years will not be penalized, they will be allowed to enroll for it in the third year, since it started in 1971 and covers a period of five years.

A subsidy of two cents a bushel up to a limit of \$2,000 will be paid to any individual, organization or firm which undertakes to pick up this wheat anywhere in the province. The subsidy will be granted on strict condition that the wheat shall be paid for at market prices according to quality.

III — WHITE BEANS

The Quebec market absorbs the yield from about 13,000 acres of white commercial beans, but Quebec canners are still almost entirely dependent on supplies from elsewhere.

The Department is aware of the risks involved in growing this crop but, in view of its possible considerable profitability, wishes to encourage its establishment in a gradual, orderly and prudent manner.

No direct financial inducement will be offered to growers but the Department undertakes to provide the services of experienced specialists to increase their chances of success. A sum of up to \$12,000 has been allotted for this purpose in the Department's budget.

IV — 1972 REGIONAL FODDER CORN CONTEST

The outskirts of the Plain of Montreal, although unsuited to

grain-corn growing are favourable for fodder-corn.

In order to promote this crop and make livestock farms more profitable, the Department of Agriculture and Colonization offers \$2,000 to be distributed among the 10 leading competitors in this contest.

Territory: The contest is limited to the following agricultural regions: Numbers 2 (Quebec), 3 (South of Quebec), 4 (Nicolet), 5 (Eastern Townships), 8 (Ottawa Valley), 10 (North of Montreal), 11 (St. Maurice Valley).

Conditions:

Competitors are required:

1. To sow at least **15 acres** to one variety only;
2. To have signed and submitted an application to enter the contest to the agronome's office before August 1, 1972;
3. To sow one of the varieties officially recommended by the Quebec Plant Productions Council and needing at least 3,000 heat units. The difference between the number of heat units for the region and the number needed by the variety sown should not exceed 500.

Judging: The final judging will take place during the week of September 18, 1972 and the judges will have 35 competitors to visit — five in each region.

Judging will be based on the appearance of the field, the consistency of the grain, the formation and quality of the ears, the stand, and the probable yield. The judges' decision shall be final.

PREVENTIVE HYGIENE PROGRAM

I — Preventive Vaccination Against Blackleg:

The Department of Agriculture and Colonization recommends that all young cattle in districts where blackleg is prevalent be vaccinated against the disease. The purpose of the vaccination is to protect calves against blackleg and to prevent renewed contamination of the soil by bodies of animals which have died of the disease. These vaccinations should be carried out in blackleg infected districts.

Blackleg infected districts:

This term includes not only those farms or feedlots where the disease has been found but also all farms bordering on the infected premises or situated along a watercourse draining any area contaminated by the bodies of animals which have died of the disease.

Calves reared on farms where blackleg has been identified or kept on farms near sources of infection should therefore be protected against the disease.

Age of cattle to be vaccinated:

Animals between 3 and 30 months old may be immunized. This does not authorize immunization of animals in any of the three following categories: a) Calves less than three months old; b) Animals over 30 months old; c) Any animal which has already been vaccinated with the same vaccine.

Subsidized blackleg vaccination is authorized during the 12 months of the year.

The owner will be charged 10 cents for each animal vaccinated. The Department undertakes to provide the vaccine and pay the veterinarian who administers it.

Cooperation required from veterinarians:

To ensure best possible results from systematic mass vaccination, each veterinarian should follow the procedure described below:

- a) Send for the necessary number of report forms and the quantity of vaccine he expects to use;
- b) Proceed with the work without waiting for further authorization, but in no case treat any animal outside the district of his regular private practice;
- c) Vaccinate animals which are at least three months old but not more than 2½ years old and have never been vaccinated against blackleg;
- d) Vaccinate only young cattle which are being raised and only in districts where blackleg has been observed at least once during the past three or four years;
- e) Collect 10 cents for each animal vaccinated and then send in a receipt signed by himself and the owner of the animals or his representative;
- f) Report on his work to the Service, sending with the reports a money order or cheque, payable to the Minister of Finance, for all his collections.

Cooperation required from farmers: Any farmer wishing to take advantage of this offer of vaccination at the Department's expense must:

Apply directly to a veterinary practitioner and not to the Department of Agriculture and Colonization. If the veterinarian is not willing to undertake the work, the request should be made through the Department's regional agricultural office;

Several days at least before the veterinarian's visit, let him know how many animals are to be vaccinated;

On the day and, if necessary, at the time set for the vaccination, keep his young cattle in the barn and fasten them or otherwise immobilize them to the veterinarian's satisfaction;

Consult with neighbours, so that possibly the animals of all of them can be vaccinated at the same time and during one session;

Bodies of animals that have died of blackleg must not be skinned or left lying in the fields; they must be burned or buried deeply covered with quicklime. It is important to break the cycle of development of this disease by preventing continuous re-infection of the soil by infected carcasses.

— Anti-Brucellosis Vaccination

(Federal-provincial agreement)

farmers may apply to have their calves immunized with vaccine of lone 19 in conformity with the provisions of the federal-provincial agreement.

For this purpose, the farmer must undertake to:

Have his young cattle vaccinated at the age now stipulated or at an age which the veterinary director general may decide in future;

Retain the services of a veterinarian legally qualified to

practise within the province;

c) Facilitate the work of vaccination by rounding up, sorting out, and immobilizing the animals he is entitled to have vaccinated;

d) Permit and facilitate the identification of the vaccinated animals by means of a special tag in the right ear of calves or by markings assigned to each animal by the Canadian National Livestock Records;

e) Not to allow any anti-brucellosis vaccine to be used on his cattle except that which will be supplied by the Canada Department of Agriculture;

f) To assume responsibility for the expenses incurred for these vaccinations and for paying the veterinarians who perform them;

g) Not to claim any compensation for accidents, diseases, harm or supposed harm which he may attribute to or connect with the veterinarian's operations, including the administration of the vaccine;

h) Not to add any bovine animal to his herd except for animals which satisfy the provisions of paragraphs a, b, or c of section 156E, Part XIII—A of the Animal Contagious Diseases Act (R.S., c. 6s. 1).

The farmer recognizes that:

a) He has been informed that vaccination alone is not enough to ensure effective protection against brucellosis;

b) He is not entitled to any vaccination certificate if the treatment is administered to an animal outside the stipulated age range or with vaccine whose effectiveness is not recognized, or if the identity or age of the animals has not been accurately given.

III — Preventive Vaccination of Mink Against Distemper, Botulism, and Infectious Enteritis:

The purpose of these vaccinations is to:

a) Prevent outbreaks of distemper, botulism, and infectious virus enteritis among mink;

b) Make available to mink breeders, for a small charge, the vaccines needed for the prevention of these three diseases, which can cause considerable losses in their herds;

c) Provide them with the services of veterinarians to administer the vaccines.

Breeder's responsibilities:

a) A charge of three cents per dose of vaccine must be paid by mink breeders wishing to make use of preventive vaccination against distemper — single vaccine;

b) A charge of four cents per dose of vaccine must be paid by mink breeders wishing to make use of preventive vaccination against botulism and infectious enteritis — combined vaccine;

c) If a breeder wishes to make use of vaccination against all three diseases he must pay a charge of seven cents per animal;

d) The breeder must provide the assistance needed to administer the vaccine;

e) In order to make this assistance policy easier to carry out, the vaccinations must be performed at the following times:

1. Young mink: from the 1st of July to the 15th of September (9 to 10 weeks of age).
2. Adults: from the 1st of December to the 15th of February (at least one month before mating).

f) The cost of the vaccines and the veterinarian's fees will be paid by the Department.

The Department will not be responsible in any way for deaths, losses, accidents or damages following upon vaccinations.

Veterinarian's responsibilities:

- a) At a mink breeder's request the veterinarian may agree to vaccinate his animals against distemper, or against botulism and infectious enteritis, or against all three diseases:
- b) The amount of the charges collected by the veterinarian must be sent by cheque or money order to the Quebec Minister of Finance.

Responsibilities of the Veterinary Service:

- a) The Veterinary Service will supply on request, the vaccine against distemper (single vaccine), the vaccine against botulism and infectious enteritis (combined vaccine), or both vaccines if required.
- b) The veterinarian's fees (not including travelling expenses) will be repaid at the following rates: eight cents per animal vaccinated against distemper; eight cents per animal vaccinated against botulism and infectious enteritis; ten cents per animal vaccinated against all three diseases.

IV — Joint Program with the Canada Department of Agriculture

In view of the losses sometimes suffered by farmers owing to the occurrence of rabies among their animals and resulting danger to humans, a joint program has been made the subject of an agreement between the Quebec Department

of Agriculture and Colonization and the Canada Department of Agriculture;

WHEREAS rabies can cause serious losses among the cattle, horses, sheep, pigs and goats of the farmers of the province, especially in event of an epidemic;

WHEREAS, under the regulations enacted by Order in Council No. 1302 on the 14th of July 1966, the Minister of Agriculture of Canada is authorized to reimburse the province to the extent of 40 per cent of the sum paid by the province to compensate owners of animals which die of rabies, such compensation not to exceed:

- a) \$120 for a bovine animal,
- b) \$100 for a horse,
- c) \$40 for a sheep,
- d) \$40 for a pig,
- e) \$40 for a goat;

WHEREAS there is good reason to protect the farmers of the Province against the ravages of this disease, compensation will be paid by the Department of Agriculture and Colonization to the owner of a farm animal which dies of rabies, the said compensation not to exceed the following amounts:

- a) \$300 for a bovine animal,
- b) \$250 for a horse,
- c) \$100 for a sheep,
- d) \$100 for a pig,
- e) \$100 for a goat;

No compensation will be paid unless the Department of Agriculture and Colonization receives a certificate in duplicate signed by a veterinary inspector appointed under the Animal Contagious

Diseases Act (R.S.C. 1952, Chapter 9) attesting that the animal died from rabies and setting a value on it.

V — Compensation to Farmers Suffering Losses of Cattle or Sheep

In order to supplement the program of contributory animal health insurance, the Department of Agriculture and Colonization is also continuing the assistance measure already in force for the benefit of farmers who find themselves in a precarious situation owing to considerable losses of cattle or sheep.

Benefits:

- 1. Farmers whose losses satisfy the conditions of this assistance policy will receive a fixed indemnity per bovine or ovine animal unit;
- 2. A farmer considered to be eligible will choose the replacement animals himself. The Department of Agriculture and Colonization will not be responsible for any pathological conditions that may ensue.

The Department's assistance is subject to the following conditions:

- 1. The compensation applies to losses from acute diseases, acute poisoning or specified accidents on the farm: lightning, fire, accidental electrocution;
- 2. Per cent losses for entitlement to compensation are as follows:

40%	in the case of a herd or flock of				5 to 10 ani-
	mal units				
35%	"	"	"	"	11 to 15 "
30%	"	"	"	"	16 to 25 "
25%	"	"	"	"	26 to 50 "
20%	"	"	"	"	more than 50

to compensation will be paid in the case of a herd or flock of fewer than five animal units;

The number of animal units in the herd or flock is reckoned as follows:

cattle	Unit Value
mature cows, in calf heifers, mature bulls	1 unit
open heifers aged 24 to 35 months inclusive	$\frac{1}{2}$ "
cattle aged 12 to 23 months inclusive	$\frac{1}{3}$ "
calves aged six to 11 months inclusive	$\frac{1}{4}$ "
calves under six months old	$\frac{1}{6}$ "
sheep:	
mature ewes and young ones in lamb	1 unit
mature rams	1 "
lambs aged six months to a year	$\frac{1}{2}$ "
lambs under six months old	$\frac{1}{4}$ "

In the case of losses of cattle or sheep due to attacks by wild animals, the per cent loss required for entitlement to compensation is 10 per cent.

This assistance also applies on the following terms to bovine fertility of an infectious or nutritional origin, and to certain diseases whose severity or chronic nature are such as to justify prognosis of long-term unprofitability and for which there is no effective means of prevention or treatment:

- the nature of the infection or nutritional deficiency must be clearly established by the department's laboratories;
- the cause of the trouble, whether infectious or nutritional, must not endanger the health of the replacements in any way;
- the per cent losses needed to qualify for compensation in this case are double those mentioned in article 2.

Diagnosis of the disease, poisoning, or accident must be clearly established by the Veterinary Service of the Department of Agriculture and Colonization or its representative.

6. From now on, the farmer will not be required to make the previously required contribution of \$100 per bovine animal and \$15 per sheep.

7. The Department of Agriculture and Colonization will make a grant of \$250 per bovine animal unit lost or \$25 per ovine animal unit lost, upon receipt of proof of purchase of the replacement. The government's aid is limited to 75 per cent of the losses up to a maximum of 10 bovine animal units and 50 ovine animal units per farmer.

8. Chronic disease (except those covered by article 4) and diseases for which the Department of Agriculture and Colonization already provides preventive vaccination, diseases named by the Department of Agriculture of Canada and accidental causes other than those specified above are not covered by the policy.

9. Owners of livestock who have not called in their veterinarian or are found to have been negligent in the care of their flocks or herds or in applying elementary principles of hygiene will be refused the Department's aid.

10. The Department of Agriculture and Colonization will demand restitution if the application for assistance is shown to contain false statements.

11. The farmer must not choose and buy his replacement animals before his claim has been approved by the head of the Veterinary Service. Regional livestock advisers of the Department are available to help farmers choose replacements.

VI — Aid for the Establishment of Veterinarians in Handicapped Regions

Notwithstanding the introduction of contributory animal health insurance, some parts of the province, owing to their remoteness or sparse livestock populations, are unattractive to veterinary practitioners, who naturally tend to choose more promising centres. In order to help farmers who thus find themselves deprived of an essential service, the Department of Agriculture and Colonization maintains a program designed to encourage qualified veterinarians who are willing to practise in such areas. This program applies to the following counties: Abitibi - East, Abitibi - West, Bonaventure, Gaspé-North, Gaspé - South, Gatineau, Magdalen Islands, Labelle, Matane, Matapédia, Pontiac, Rimouski, Rouyn - Noranda, Témiscamingue, Témiscouata, and specified localities in Frontenac.

The veterinarian:

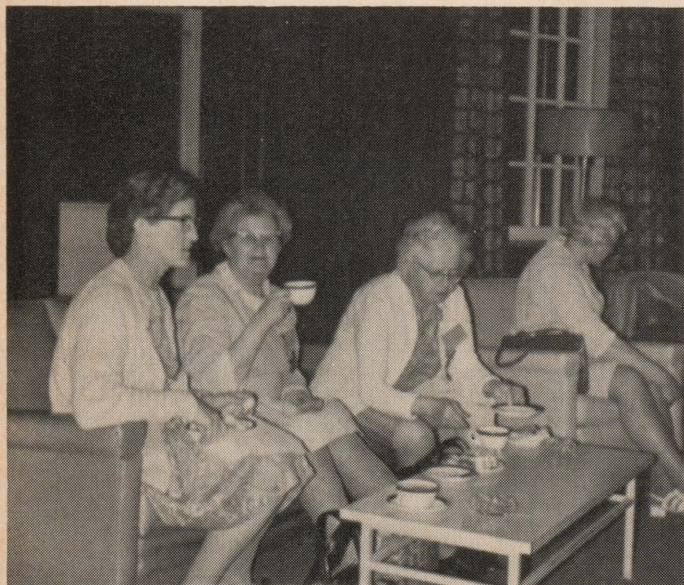
1. Must be a graduate of the Veterinary College of the Province of Quebec;
2. Shall undertake to open and maintain an office at a place to be designated by the veterinary director;
3. Must sign an agreement specifying the conditions of his engagement;
4. Must specifically undertake to provide an adequate veterinary service at the standard rates in effect in other parts of Quebec.

The responsible authorities of the Department agree to pay such veterinarians a fee of \$5,000 in 12 consecutive, equal instalments.

(More Assistance Programs next month.)



The recent Annual Convention of the Quebec Women's Institutes afforded an opportunity for photo-taking. Some of these photos appear in this issue; others will be featured in future issues of the Journal. Above is a photo of the Q.W.I. Executive and the Provincial Conveners. Standing from left to right: Mrs. Jas. Robertson, Welfare and Health, Mrs. Perley Clark, Publicity, Mrs. Sidney Patterson, Citizenship, Mrs. Roland Graham, Home Economics, Mrs. Patrick Jones, Education, and Mrs. Gordon French, Agriculture. Seated from left to right: Past President Mrs. George McGibbon, President Mrs. V. R. Beattie, 2nd Vice President Miss Edna Smith, 1st Vice President Mrs. J. W. Westover, and Treasurer Mrs. G. E. Cascadden.



Four members enjoying the refreshments which were served by the West Island branch at the close of each evening's activities.



The handicrafts display is always popular. Seen here is the handicrafts judge Miss S. Auger, of the Home Economics and Handicrafts Division of the Quebec Department of Agriculture, and Mrs. J. W. Westover.



Above: Guest speaker Mrs. Graham Spry, Deputy President of
 CWW. Top right: 1st Vice President Mrs. J. W. Westover and
 resident Mrs. V. R. Beattie enjoyed the Macdonald College Women's
 associates' tea. Middle right: Past President Mrs. G. McGibbon
 and Women's Associate member Mrs. R. H. Common, who poured
 for the Board members. Bottom: Miss Hilda Graham leads the
 members in a spirited singsong.





Annual Convention

Although "The Road to Understanding", theme of the 58th Annual Convention of the Quebec Women's Institutes, did not begin or end with the recent meeting held at Macdonald College, many local and global miles were covered. And the world seemed suddenly smaller as local concerns were discussed side-by-side with problems in far corners of the world.

The talks given by Dr. A. C. Blackwood, Vice Principal of Macdonald College, Mrs. Graham Spry, Deputy President of the Associated Country Women of the World, and Dr. Stuart Hill, of the Department of Entomology at Macdonald and Research Adviser to STOP, gave delegates and visitors much to contemplate in the months ahead. The Road to Understanding is not always smooth, nor is it without its curves and detours, its sharp corners and steep hills but just being on the road is the important thing, and we hope that the miles covered at Convention were both pleasant and profitable for you.

For their continued support of the Q.W.I., we would like to extend our thanks and appreciation to the Faculty and staff of Macdonald College.

Highlights of Mrs. Spry's speech will be published in the next issue of the Journal. Watch for it. A copy of Dr. Hill's address has been mailed to each Branch Secretary.

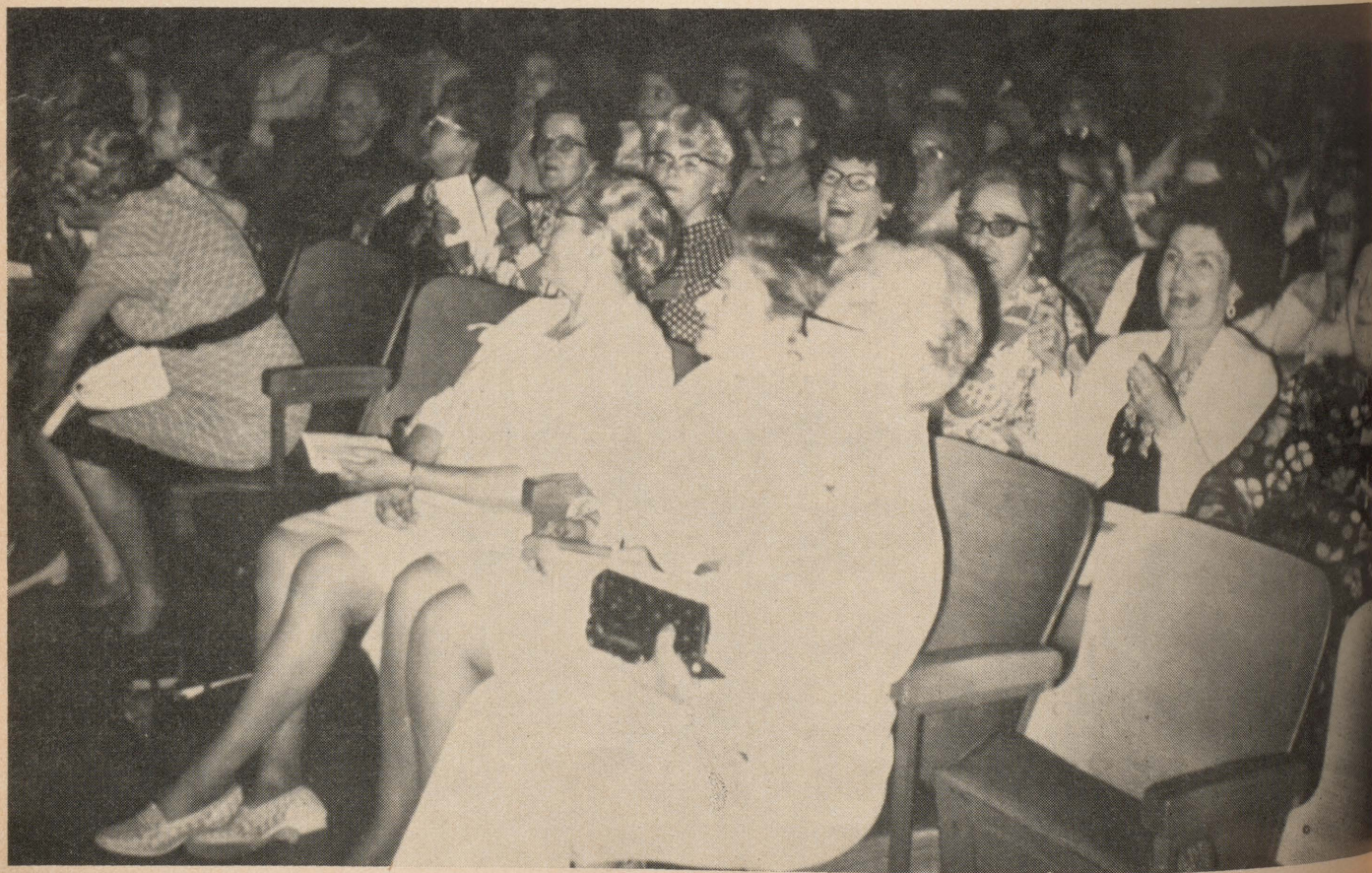
Provincial Executive

Past President: Mrs. G. McGibbon, R. R. 2, Brownsburg, Que.
 President: Mrs. V. R. Beattie, R. R. 1, Richmond, Que.
 1st Vice-President: Mrs. J. W. Westover, Box 295, Sutton, Que.
 2nd Vice-President: Miss Edna Smith, Box 488, Lennoxville, Que.
 Treasurer: Mrs. G. E. Cascadden, Box 371, Lennoxville, Que.

Provincial Conveners of Standing Committees

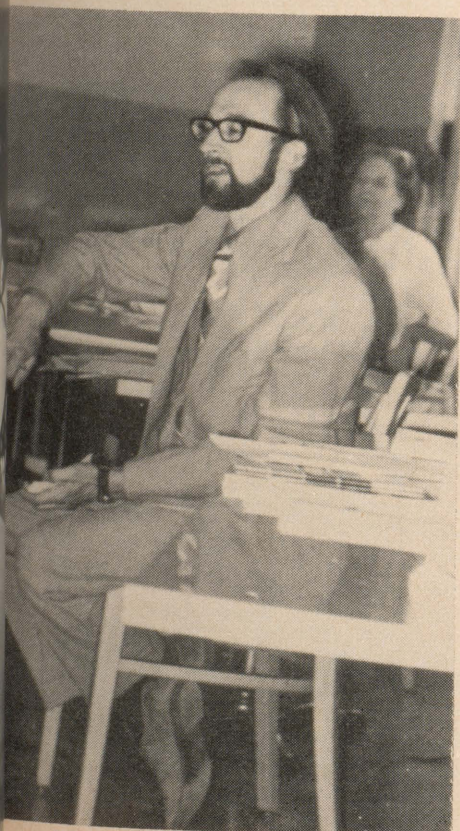
Agriculture: Mrs. Gordon French, R. R. 2, Sawyerville, Compton Co., Que.
 Citizenship: Mrs. Sidney Patterson, R. R. 1, Box 78, Gaspé, Gaspé Co., Que.
 Education: Mrs. Patrick Jones, Box 218, Port Daniel, Bonaventure Co., Que.
 Home Economics: Mrs. Roland Graham, R. R. 2, Quyon, Pontiac Co., Que.
 Publicity: Mrs. Perley Clark, R. R. 1, Brownsburg, Argenteuil Co., Que.
 Welfare and Health: Mrs. Jas. Robertson, R. R. 2, Hemmingford, Chateaugay-Huntingdon Co., Que.

Dr. A. C. Blackwood, Vice Principal of Macdonald College, welcoming Q.W.I. members to the Campus. Below: Thursday evening's entertainment of plays and singing was obviously a success!





Above: Four hostesses take time off from greeting
 members. Right: Miss V. Moranville, Chairman of the
 nominating Committee and Mrs. Graham Spry.
 (Mrs. Sidney Patterson, of Gaspe County, was elected
 Provincial Convener of Citizenship.) Bottom left: Dr. Stuart
 L., in his address to the members, gave much useful
 information on the fight against pollution. Of particular
 interest were his gardening hints. Bottom right: Missisquoi
 County's play "Don't Push the Panic Button" was
 awarded first prize by Adjudicator Dr. D. K. Kevan.



Macdonald Reports

Convocation '72

After days of rain, Convocation weather — warm and sunny — greeted the graduating class of '72 on Saturday, June 3.

Convocation was chaired by Mr. S. M. Finlayson, Chairman of the Board of Governors. An Honorary Degree of Doctor of Science was awarded to Dr. Arthur Charles Neish. This honorary degree, which was presented by Dr. W. E. Sackston, was accepted by Mrs. Neish due to her husband's illness.

Dr. Neish was born in Nova Scotia and started his scientific training at the Nova Scotia Agricultural College at Truro, then took his B. Sc. and M. Sc. degrees at Macdonald College and his Ph.D. on the Montreal Campus of McGill.

His academic ability became apparent on his first contact with science. He won a medal and a scholarship at Truro, and prizes and distinction at Macdonald and in his graduate work.

In his chosen professional sphere as a chemist, he fulfilled the promise of brilliance shown in his M. Sc. research, pioneering work with isolated chloroplasts. He became interested in lignins, in fermentations, in carbohydrate metabolism, in phenolics. Those interests, during his career at McGill until 1943, his work with the National Research Council at Ottawa until 1948, at Saskatoon until 1961, and at the Atlantic Regional Laboratory since then, have borne much fruit. He has published well over 100 research papers, all of them contributions

appreciated and much quoted by other workers in the various fields of chemistry which he has cultivated. He has written chapters of books edited by others, and co-authored one of his own. Most recently, he is developing techniques to "farm" seaweed.

His accomplishments have brought him many honours. Among others, he was elected a Fellow of the Chemical Institute of Canada, and was its Merck Lecturer. He was elected a Fellow of the Royal Society of Canada in 1960, and of the Royal Society, London, 1971. Mount Allison University conferred an honorary Doctor of Science degree on him in 1967.

Following the presentation of diplomas and degrees, Principal Bell gave a brief address. In the evening, a cocktail party and banquet was held for the graduates, their parents and friends.

Faculty of Agriculture

Diploma in Agriculture

**Candidates presented by
Professor P. Y. Hamilton,
Director of the Diploma Course**

Adler, Stephen Michael, St. Laurent, Que., Second Class Honours;
Andrasi, Mrs. Mary, Montreal, Que., Second Class Honours;
Barrington, Keith Elmer (in absentia), Ormstown, Que., Second Class Honours;
Chang, Alexander Shew-Wah, St. Eustache, Que., Second Class Honours;
Minister of Agriculture and Colonization Medal for Horticulture;
Coupland, Gerald Ellis, Granby, Que., Second Class Honours;
Eaton, James George Jr., Lachine, Que., Gruer, Baird Wallace, Ormstown, Que., Second Class Honours;

Halsall, Herbert Allan, Cookshire, Que., Second Class Honours; Prize for Highest Standing in the Project in the graduating year;
Hamilton, James William, Ormstown, Que., Second Class Honours;
Hulse, Charles Thomas W., Arica, Chile, Second Class Honours; Minister of Agriculture and Colonization Medal for Animal Science;
Lewis, Daniel Alfred (in absentia), Coaticook, Que., Second Class Honours;
MacFarlane, Hugh John, Philipsburg, Que., Second Class Honours;
Matheson, Malcolm Gordon (in absentia), Nicaragua, Central America, Second Class Honours;
McAdam, Douglas George, Hemmingford, Que., Second Class Honours;
Rideout, James Richard, Montreal, Que., Rogers, Robert Louis, Cowansville, Que., Second Class Honours;
St. Cyr, James Joseph (in absentia), Richmond, Que.,
Wera, Guy, Lennoxville, Que.

Degree of Bachelor of Science in Food Science

**Candidates presented by
Professor H. R. Neilson,
Director of the School of Food Science**

Beal, Barbara Elizabeth, Huntingdon, Que., (Dietetics), Second Class Honours;
Bell, Penelope Anne, Burlington, Ont., (Dietetics), Second Class Honours;
Boyce, Joyce (in absentia) St. Peter, Barbados, (Dietetics), Second Class Honours;
Campbell, Elizabeth Gail, Moncton, N.B., (Dietetics) Second Class Honours;
Chiu, Doris Sio Lan (in absentia), Domingos, Macao, (Dietetics), First Class Honours; University Scholar;
Cummins, Martha Marian, Dorval, Que., (Consumer Education), Second Class Honours;
Durnan, Mary Ann, Dollard des Ormeaux, Que., (Home Economics), Second Class Honours;
Hallam, Andrew Thomas, Montreal, Que., (Food Management), Second Class Honours;
Little, Heather Faeye D., Baie d'Urfé, Que., (Consumer Education), Second Class Honours;
McCaffery, Sharon Patricia, Vaudreuil, Que., (Dietetics), Second Class Honours;
Garland Prize;
McCartney, Nancy Jean, Pointe Claire, Que., (Dietetics), Second Class Honours;
O'Brien, Sheila Mary, Greenfield Park, Que., (Dietetics), First Class Honours;
Governor General's Medal, Harrison Prize;

liver, Sharon Marie, Pointe Claire, Que.,
(Consumer Education), Second Class
Honours;
auve, Danielle Alice, Montreal, Que.,
(Food Management), Second Class
Honours;
Walker, Margaret Helen, Picton, Ont.,
(Dietetics), Second Class Honours;
Wallace, Sherry Lynn, Largo, Florida,
(Consumer Education), Second Class
Honours.

Degree of Bachelor of Science in Agriculture

**Candidates presented by
Professor A. C. Blackwood,
Dean of the Faculty of Agriculture**

W-Yong. Lai Mon (in absentia),
Kuala Lumpur, Malaysia,
(Animal Science), Second Class
Honours;
Bailey, Robert Owen (in absentia),
Lascouche, Que., (Wildlife Resources),
First Class Honours; University Scholar;
Bell, Jon Dennis, Laval, Que., (Botanical
Sciences), Second Class Honours;
Bishop, Gary Everett (in absentia),
Wolfville, N.S., (Agricultural Engineering),
Second Class Honours;
Blackwell, Stephen King (in absentia),
Montreal, Que., (General Agricultural
Science), Second Class Honours;
Calfat, Claire, St. Laurent, Que., (Micro-
biology), Second Class Honours;
Carmichael, Raymond Paul (in absentia),
Montreal, N.B., (Plant Science-Agro-
nomy), Second Class Honours;
Coles, Charles Edward, Winsloe, P.E.I.,
(General Agricultural Science), Second
Class Honours;
Comeau, Neil Benoit (in absentia),
Meteghan, N.S., (General Agricultural
Science), Second Class Honours;
Couture, Marcel Joseph, Kirkland, Que.,
(Agricultural Economics), Second Class
Honours;
Cronin, Catherine Louise, Bolivar, N.Y.,
(General Agricultural Science);
Crosby, Donald Gordon John (in
absentia), Longueuil, Que., (Plant
Science — Horticulture), First Class
Honours; University Scholar;
Dalton, Robert Ira (in absentia), Angers,
Que., (Animal Science), Second Class
Honours;
Dancose, Daniel Thomas, Montreal, Que.,
(Zoological Sciences), Second Class
Honours; Lochhead Memorial Prize;
Empster, David Andrew, Farnham,
Que., (Agricultural Economics);
Enuke, Carl Frederick (in absentia),
Kirkville Beach, N.S., (Animal Science),
Second Class Honours;
Guay, Frank Leo (in absentia), Truro,
S., (Agricultural Economics);

DEPTAVAC-HVT*
VACCINE
Life-Time Protection
against Marek's
disease

Dose: 0.2 cc.
Working Time: 2 hours

MSD Merck Sharp & Dohme
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Animal Health Products
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for Marek's Disease Vaccine.
Live Turkey Herpes Virus.

Dyer, James Arthur, Sutton, Que., (Soil Science), Second Class Honours;
 Dykeman, Brian Westrup (in absentia), Young's Cove, N.B., (Plant Science — Agronomy), First Class Honours;
 McConnell Scholar, Cutler Shield;
 Evertsen, Johannes Adrianus, Julianadorp, Curaçao, N.A., (Botanical Sciences), Second Class Honours; Coulson Gold Medal & Prize;
 Faber, Doeke (in absentia), Langweer, Holland, (Agricultural Economics), Second Class Honours;
 Forsythe, Terry Grant, (in absentia) Kentville, N.S. (Microbiology) Second Class Honours;
 Gallant, Judith Ellen, Montreal, Que., (Animal Science), Second Class Honours; Gilliat, Paul Bruce (in absentia) Granville, Centre, N.S., (Agricultural Economics), Second Class Honours;
 Gonzalez, Liborio John (in absentia), Orange Walk Town, British Honduras, (Animal Science), Second Class Honours; Greisbach, Franz (in absentia), Montreal, Que., (Agricultural Economics), Second Class Honours;
 Griffiths, Larry Robert (in absentia), Amherst, N.S., (Animal Science), Second Class Honours;
 Guild, James Robert, Pointe Claire, Que., (Animal Science), Second Class Honours; Harris, James Wendell (in absentia), Summerside, P.E.I., (General Agricultural Science), Second Class Honours;
 Hiscock, Dell Andrew (in absentia), Plaster Rock, N.B. (Wildlife Resources); Hooper, Hurdon Arthur, Sutton, Que., (Soil Science), Second Class Honours;
 Horner, Edgar Leslie, Shawville, Que., (General Agricultural Science); Johnson, Allan Alexander, Kitty Village, Guyana, (Agricultural Chemistry), First Class Honours; University Scholar;
 Johnston, Allister Lawrence, Lachine, Que., (General Agricultural Science), Second Class Honours;
 Johnston, James Dennison, Knowlton, Que., (Agricultural Economics), Second Class Honours;
 Johnston, William Sanford, (in absentia), Dorval, Que. (Wildlife Resources), Second Class Honours;
 Kamaruzzaman, Zulkifli Bin (in absentia), Johore Bahru, Malaysia, (Soil Science), Second Class Honours;
 Keeler, Roy Rexford, Ormstown, Que., (General Agricultural Science), Second Class Honours;
 Lee, Shing U, Klang, Malaysia, (Animal Science), Second Class Honours;
 Lemire, Michel Richer (in absentia), Montreal, Que., (Animal Science), Second Class Honours;
 Locke, Donald Forrest, Montreal, Que., (General Agricultural Science), Second Class Honours;
 MacLaine, Wendell Roderick (in absentia), Cornwall, P.E.I. (Wildlife Resources), Second Class Honours;
 McAndrew, Neville Compton, Queenstown, Guyana, (Plant Science — Agronomy), Second Class Honours;
 McGibbon, Ian Stuart, Beaconsfield, Que., (Animal Science), First Class Honours;
 Canadian Society of Animal Science Prize;
 Nussey, Brian John, Ormstown, Que., (General Agricultural Science);
 Oodally, Goolam Mohamed, Rose-hill, Mauritius, (Soil Science), Second Class Honours;
 Pageau, Joseph Henri-Paul, Montreal, Que., (Microbiology), Second Class Honours;
 Reddick, Francis Burton, Riverfield, Que., (Plant Science — agronomy), Second Class Honours;
 Roop, Robert Barry (in absentia), Brookfield, N.S., (Agricultural Economics), Second Class Honours;
 Rosewell, Kenneth Thomas, Pointe Claire, Que., (Agricultural Chemistry), First Class Honours;

Senay, Luc, St. Cesaire, Que., (General Agricultural Science), Second Class Honours;
 Sheppard, James William, St. John, N.B., (Botanical Science), Second Class Honours;
 Smith, Robert Floyd (in absentia), Aylesford, N.S., (Plant Science — Horticulture), Second Class Honours;
 Stewart, Robert William, Farnham, Que., (Wildlife Resources), First Class Honours; Governor General's Medal;
 Stone, Philip Michael (in absentia), Montreal, Que., (Agricultural Economics), Second Class Honours;
 Suddard, William Douglas, Oshawa, Ont., (General Agricultural Science), Second Class Honours;
 Titus, Ronald Gerald, Sussex, N.B., (Animal Science);
 Trenholm, Donald Gordon (in absentia), Amherst, N.S., (Soil Science), Second Class Honours;
 Tsang, Yuk Luen, Kowloon, Hong Kong, (Microbiology)
 Val, Peter, Rosemere, Que., (Soil Science), Second Class Honours;
 Wallwork, Judith Anne, Pointe Claire, Que., (Animal Science), Second Class Honours;
 Weatherhead, James Ray (in absentia); Upper Rawdon, N.S., (Animal Science), Second Class Honours;
 Welling, Wayne Baxter (in absentia), Dorchester Crossing, N.B., (Animal Science), Second Class Honours;
 Wilson, Alexander John (in absentia), Bridgetown, N.S., (Plant Science — Agronomy), Second Class Honours;
 Younie, Colleen Estelle, East Angus, Que., (General Agricultural Science), First Class Honours; Stern Cup;
 Younie, Harry Cecil, Howick, Que., (Soil Science), Second Class Honours.

Degree of Bachelor of Science in Agricultural Engineering

Candidates presented by
Professor A. C. Blackwood,
Dean of the Faculty of Agriculture

Cuthbertson, Harold Ellwin, Shawville, Que., Second Class Honours;
 Desir, Finbar Lambert, Anse-La-Raye, St. Lucia, W.I., Second Class Honours;
 Emmett, Roger William, Ile Perrot, Que., Second Class Honours;
 Mailloux, Joseph Claude, Baie d'Urfé, Que.,
 Neilson, Ralph David, Fredericton, N.B., Second Class Honours;
 Smyth, Kenneth Howard (in absentia), Lennoxville, Que., Second Class Honours;
 Zipp, Herman, Sudbury, Ont., Second Class Honours.

Faculty of Graduate Studies and Research

Candidates presented by
Professor L. Yaffe,
Pro-Dean of the Faculty of Graduate Studies and Research

Master of Science

Ahmed, Shaik Rafeeqe, B.V.Sc. (India), India, (Animal Science) (in absentia); Buraimo, Olalere O., B. Sc (Agr.) (Nigeria), Nigeria (Animal Science), (in absentia);

Dodds, James Allan, B.Sc. (Hons.) Botany (Leeds), England (Plant Pathology) (in absentia);
 Elliott, Michael Hayden, B.Sc. (Agr.) (McGill), Jamaica (Animal Science) (in absentia);
 FitzGerald, Gerard John, B. Sc. (Memorial), Newfoundland (Woodlot Management) (in absentia);
 Forge, Andrew, B.Sc. (Bristol), England (Microbiology) (in absentia);
 Githaiga, Jackson Munyori, B. Ed. (East Africa), Kenya (Agronomy) (in absentia);
 Griswold, Alexander Grant, B. Sc. (Agr.) (McGill), Nova Scotia (Entomology) (in absentia);
 Inhaber, Jack, B.A. (Sir George Williams), Quebec (Woodlot Management) (in absentia);
 Lu, Fu-ming, B.Sc. (Agr.) (Taiwan), Republic of China, (Agricultural Engineering) (in absentia);
 Martin, Jacques J., L.S.A. (Montreal), Quebec (Animal Science);
 Martin, Leonard J. F., D.V.M. (Guelph), Saskatchewan, (Animal Science);
 Ositelu, Gabriel Segum, B.Sc. (Agr.) (Wales), Nigeria (Animal Science) (in absentia);
 Quintyne, Robert Carlisle, B.Sc. (Agr.) (McGill), Barbados (Animal Science) (in absentia);
 Ramtahal, George H., B.Sc. (Agr.) (West Indies), Trinidad, (Agricultural Engineering) (in absentia);
 Richards, Paul Glyndwr, B.Sc. (London), England (Entomology) (in absentia);
 Sosnowski, Bozena Magdalena, S. G. G. W. (Warsaw), Poland (Entomology) (in absentia).

Doctor of Philosophy

Amer, Mohamed, B.Sc. (Cairo); Diploma in Food Chemistry (Munich); M.Sc. (Guelph), Egypt (Animal Science).
 "Effect of supplemental copper and Vitamin E on the chemical and physical characteristics of swine depot lipids."
 Araujo, Hyma Rita B., M.Sc. (Kerala); B.Ed. (Kerala); M.A. (Immaculate Heart College), India (Parasitology) (in absentia).
 "The immunology of host parasite relationships in avian coccidiosis."
 Bonaparte, Ebenezer Eric Nii Adu, B.Sc. (Agr.) (London), D.T.A. (Trinidad), M.Sc. (McGill), Ghana (Agronomy) (in absentia).
 "Leaf number and maturity studies in Zea mays L."
 Brouzes, Raymond P., B.Sc. (Laurentian), M.Sc. (McGill), Iran (Microbiology).
 "The effect of oxygen on nitrogen fixation and acetylene reduction in soil and in pure culture systems."
 Esan, Benjamin Olatunji, B.Sc. (Agr.) (Ibadan), M.Sc. (Saskatchewan), West Nigeria, (Animal Science) (in absentia).
 "Analysis of variations due to genetic and environmental factors in gross milk constituents in Quebec dairy cattle field data."
 Hennessy, Christopher Martin Reeves, B.Sc. (Hons.) (Agr. Botany) (Wales).
 Diploma in Tropical Agriculture (Trinidad), M.Sc. (McGill) U.K. (Plant Pathology).
 "Studies on variation in Puccinia helianthi."
 Malik, Sudarshan Singh, B.V.Sc. (India), M.Sc. (India), M.Sc. (McGill), West Pakistan (Animal Science).
 "Blood serum transferrin polymorphism and bovine mastitis."
 Sepahi-Donboli, Ali Reza, B.S. (Beirut), M.S. (Beirut) Iran (Agronomy) (in absentia).
 "Heritability of yield stability in barley (Hordeum vulgare L.)."
 Wright, Donald Stranack Cottle, B.Sc. (Agr.) (New Zealand), M.Sc. (New Zealand), New Zealand (Plant Pathology) (in absentia).
 "Host-parasite relationships in Verticillium wilt of tobacco."

another component of municipal waste is a high level of suspended solids and silts. These render river and lake beds unstable and unsuitable for many plants, block the filter feeding mechanisms thus killing oysters and mussels, and transform the habitat into one unfavourable to many of the organisms previously abundant. The silts in solution cut down the visibility and, more seriously, reduce light penetration. This reduces the abundance of plants, whose presence in stable numbers as opposed to the cyclic blooms (associated with eutrophication), assists the maintenance of hospitable oxygen concentrations.

Another problem is the increasing use of massive amounts of water for industrial cooling. Under natural conditions water temperatures are quite variable. Frequently the upper limits are close to the danger point for aquatic organisms, in which case slight increases of temperature may have wide effects. This is because temperature increases drastically elevate the metabolic rate and consequently the oxygen requirements of organisms. Unfortunately, higher temperatures also reduce the amount of oxygen present in fresh water. This, together with the increased metabolic rate, further increases the sensitivity of the organisms to noxious chemicals.

It is apparent, then, even from this brief survey, that man's pollutants cannot be isolated and considered individually. They act together to aggravate one another's effects.

Though the discussion has dealt primarily with examples relating to fish, it is important to realise that all organisms including bacteria, plankton, shrimps, insects etc., are affected by pollution. The effect may be death, emigration, prevention of seasonal migration essential to some species. The results, however, will be similarly deteriorating on the life of all lakes and rivers subjected to such mismanagement.

A realisation of the present damage and the potential danger is unfortunately not quite sufficient to solve the problem. It is necessary to decide how important conservation of the natural waterways is in relation to other problems of our time. Only then will it be possible to establish water quality standards that are both meaningful and enforceable.

Alan Journet,
Graduate Student
Department of Entomology
(Next month, Part II: A Question of Affluence.)



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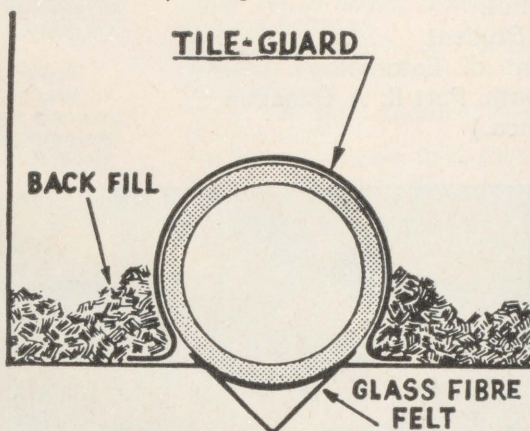
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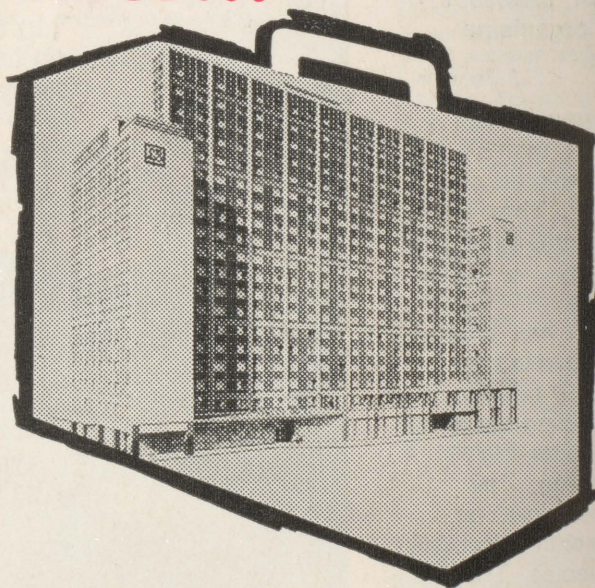
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